

Revised Draft - Sept. 6, 2006
**New Jersey Criteria for Voter- Verified Paper Record (VVPR) for Direct
Recording Electronic Voting Machines (DRE)**

Pursuant to P.L. 2005, c.137, no later than January 1, 2008, each voting machine in New Jersey shall produce an individual permanent paper record for each vote cast, which shall be made available for inspection and verification by the voter at the time the vote is cast, and preserved for later use in any manual audit. In the event of a recount, the voter-verified paper records shall be the official tally for the election.

In order to effect the intent of the statute and to instill full public confidence in the electoral process, the Attorney General is proposing the following criteria for the design and use of the Voter-Verified Paper Record System *.

I. Definitions

“Direct recording electronic voting machine (DRE)”:

A voting machine that records votes by means of a ballot display provided with mechanical or electro-optical components that can be activated by the voter, that processes the data by means of a computer program, and that records voting data and ballot images in internal or external memory components. A DRE produces a tabulation of the voting data stored in a removable memory component and a printed paper ballot.

“Voter- Verified Paper Record (VVPR)”:

A physical piece of paper on which the voter’s ballot choices are recorded, cast and preserved for later use in any recount or manual audit.

“Voter-Verified Paper Record System (VVPRS)”

This system shall include all components necessary for the production, storage and security of all paper records cast in an election. Such components shall include a printer and a storage unit

*In preparing the criteria, this office reviewed the Election Assistance Commission's (EAC) 2005 draft voluntary guidelines as well as the criteria published by other states including California and Ohio.

which all paper records are to be securely kept during the course of an election day, and thereafter, as necessary.

II. **General Description of System**

A. Components

A DRE with VVPR capability shall consist of the following components:

1. Printer: a device that will reflect the voter's selections on the DRE onto a paper record;
2. Paper Record Display Unit: a unit that will ensure a voter's ability to view his or her paper record while preventing the voter from directly handling the paper record;
3. Paper: the paper used to produce the voter-verified paper audit ballot shall be sturdy, clean, and resistant to degradation; and
4. Storage Unit: a device that securely stores all the paper records (including accepted and rejected ballots) during the course of the election and thereafter as required/or necessary.

B. Operation:

1. The VVPRS may be designed in various configurations. In all such configurations, prior to casting the ballot, the voter shall have the ability to verify his or her selections on the paper record in a private and independent manner. After a paper ballot is produced, but before the voter's ballot is recorded, the voter shall have the opportunity to accept or reject the contents of the ballot. If a voter does not accept the contents of the paper ballot, the voter shall be permitted to recast the ballot no more than two times. There shall be the ability to distinguish a voter's non-accepted ballot from his/her accepted ballot. The voter's accepted ballot shall be his or her official ballot.

2. A VVPRS may not print and store a VVPR on a continuous roll of paper.
3. The VVPRS components must conform to federal and state accessibility requirements.
 - a. This shall include, but is not limited to, an audio component that must accurately relay the information printed on the paper ballot to the voter.
4. If attached to a DRE, the VVPRS device shall draw its power from the DRE or the same electrical circuit from which the DRE draws its power.
5. To ensure vote accuracy, all VVPRS's shall:
 - a. record the offices to be voted upon, the names of the candidates, and any public questions.
 - b. record each vote precisely as indicated by the voter and produce an accurate record paper of all votes cast.

III. **Design Requirements for a VVPRS**

A. **Printer**

1. Every DRE electronic record must have a corresponding paper ballot record.
 - (a) The paper ballot record must be printed and the voter must have the opportunity to verify the paper ballot in its totality prior to the final electronic record being recorded.
2. The printer shall not be permitted to externally communicate with any system or machine other than the voting system to which it is connected.
3. The printer shall only be able to function as a printer; it shall not contain any other services (e.g., copier or fax functions) or network capability.

4. The paper path between the printing, viewing and storage of the paper record shall be protected and sealed from access, except by representatives authorized by the County Commissioner of Registration, including district board workers.
5. The printer shall be designed to produce a sufficient number of paper ballots (cast or spoiled) for any election without requiring the addition or replacement of paper record, ink, toner, ribbon or other like supply, during the voting hours.
 - a. If any addition or replacement of paper record, ink, toner, ribbon or other like supply is required, it must be done with minimal disruption to voting and without circumvention of the security features of the Printer and Storage Unit which protect the cast ballots and the secrecy of the vote. In no event, shall such any addition or replacement be required more than once during any election.
6. The printer shall be physically secure from tampering.
7. The printer shall print in no smaller than ten point font. The printer must include the capability to increase the size of the font to at least 16 point (This criteria could be met by providing a magnification device with the VVPR).
 - a. The ballot typeface must be bookman old, times new roman, arial, myriad, or its equivalent.
8. If a VVPRS uses a cutting mechanism, the blade of the mechanism shall not need to be re-sharpened for a minimum of 5 years. If sharpening is required, the vendor shall provide to the OAG documentation and a cost estimate regarding this maintenance.

B. Paper Record Display Unit

1. The Display Unit shall be positioned in such manner to allow the voter to inspect the paper record.

2. The Display Unit shall provide adequate visual space to allow the voter to privately and independently inspect the paper record. A paper record shall be readable from the same position and posture used for voting on a DRE. The voter shall have the ability to view both the review screen on the DRE and the paper record in the Display Unit simultaneously. If the paper record cannot be viewed entirely in the Display Unit at one time, the voter shall have the opportunity to verify the entire paper record prior to the electronic or the paper ballot being stored and recorded.
3. The Display Unit shall have a protective covering which shall be transparent and not obscure the voter's view of the paper record. This cover shall be in such condition that it can be made transparent by ordinary cleaning of its exposed surface.

C. Paper

1. The paper shall be designed to make the paper record readable by voters and election officials.
2. The paper shall be of such durability that it is readable for a period of at least four years after the election in which it is used, when stored according to vendor specifications.

D. Paper Record Storage Unit

1. Security protections shall be built into the Storage Unit to prevent tampering at all times, including pre-election, election day and post-election.
2. The Storage Unit must be large enough to accommodate at least 1,000 paper records.

IV. Procedural and Usability Requirements

A. Paper Records

1. Each individual paper ballot record produced shall include identification of the particular election, the election district and the voting machine.

2. The paper ballot shall include a barcode that contains the human-readable contents (shorthand is acceptable) of the paper record.
 - a. The barcode shall use an industry standard format and shall be able to be read using readily available commercial technology.
3. If the paper record cannot be displayed in its entirety on a single page, each page of the record shall be numbered and shall include the total count of pages for that ballot.
4. The image created on the paper ballot shall include every contest that is displayed to the voter on the DRE review screen including write-ins and undervotes.
 - (1) Write-ins: The voter shall be able to review any write-in vote.
 - (2) Undervote: The paper record shall provide information to allow the voter to identify the contests for which he/she has not made a selection.

B. DRE Electronic Records

1. For the purposed of an audit, if a VVPRS is attached to a DRE, the DRE's electronic ballot image shall be able to be exported. The exported electronic ballot image records shall be in a publicly available, non-proprietary format.

C. Voting Operations:

1. The Attorney General shall promulgate instructions for use of a VVPRS and shall require the vendor to provide any reference material. These instructions shall be issued to each county board of election for board worker training. Instructions for

use of a VVPRS shall be made available to the voter outside and inside the voting machine on an election day.

2. The VVPRS shall be designed to allow the voter to easily review, accept or reject his/her paper record.
3. Each voter shall be able to verify his or her votes in a private and independent manner - this includes a voter that uses an audio voting device. Voters using an audio voting device shall also be able to verify votes independently.
4. In any election where the ballot contains a language in addition to English, the paper ballot record shall be produced in all such languages.
5. The voting equipment shall distinguish between accepted and non-accepted ballots for all voters.
6. Non-accepted Ballots of Voter
 - a. The voter shall have the opportunity to accept or reject the contents of his or her paper record. If the voter rejects the contents of the record he or she may recast the ballot, but no more than two times. In such case, the third ballot cast will constitute the official ballot of that voter.
 - (1) If a mechanical error in recording or printing of a paper record occurs, the record shall be counted as a spoiled paper record.
 - (2) Upon rejecting a paper record, the voter shall be able to modify and verify the selections on the DRE without having to reselect all of their choices.
 - (3) Before the voter causes a third and final paper record to be printed, the voter shall be presented with a warning notice that the selections made on screen will be final and the voter will see and verify a printout of the votes, but will not be given additional opportunities to change any vote.

- (4) The VVPRS shall be designed to indicate the paper record which the voter has identified and cast as his/her official ballot.

V. Security and Reliability

1. All cryptographic software in the voting system shall be approved by the U.S. Government's Cryptographic Module Validation Program.
3. The printer shall be connected to the voting machine in such manner as to prevent tampering either by completely concealing the printer connection or via a security tag.
4. If a mechanical error or malfunction occurs to the paper ballot such as, but not limited to, a paper jam, running out of paper or running out of ink, the VVPRS shall suspend voting operations, not record votes and present a clear indication of the malfunction to the voter and election officials.
5. If the connection between the voting machine and the printer has been broken, the voting machine shall detect this event and record it in the DRE's internal audit log.

VI. Certification and Testing

A. Testing and certification, pre-election, election and post-election procedures for each DRE voting system shall be updated to reflect the use of a VVPRS. These updates include, but are not limited to:

1. Testing and Certification

- a. A VVPRS shall conform to state requirements. These shall include, but not necessarily be limited to, the submission of an ITA certification. For good reason shown, the ITA certification requirement may be waived. The system shall also be subject to examination by the State Voting Machine Examination Committee. Such

examination shall include, but not be limited to, the functionality, security, reliability(volume testing), durability and accessibility of the system.

- b. A VVPRS must be certified for use by the State of New Jersey in conjunction with the rest of the voting system with which it is intended to be used.
- c. A VVPRS shall not, at any time, contain or use undisclosed hardware or software. The only components that may be used in the system are components that have been tested and certified for use in the State of New Jersey.

2. Pre-Election Procedures

- a. A VVPRS's components must be integrated into existing local logic and accuracy testing requirements.

3. Malfunctions

- a. The DRE shall detect, and notify the election officials at the polling place of any errors and malfunctions, such as paper jams or low supplies of consumables, such as paper and ink, that may prevent paper records from being correctly displayed, printed or stored.
- b. The vendor shall provide to the OAG documentation for the DRE and the VVPRS that includes procedures for the recovery of votes in case of a malfunction to assure a ballot is properly recorded and stored. The OAG shall be responsible for disseminating this information to the county boards of election.
- c. The vendor shall provide to the OAG documentation for the DRE and the VVPRS that includes procedures to enable the election officials to return a voting machine to workable order after a voter has used it incompletely or incorrectly. This procedure shall not cause discrepancies between the tallies of the electronic and paper records. The OAG shall be responsible for disseminating this information to the county boards of election.

4. Post Election Procedures

- a. For any recount or audit of an election, the voter- verified paper record shall serve as the official ballot. If the electronic record of an election has been damaged or is unusable, the paper records shall be used to tally the election results.
- c. The paper record shall be created such that its contents are machine readable for purposes of any recount or audit (this may be by barcode); or initial tallying of election if the electronic record is not usable.
 - (1) The paper record shall contain error correcting codes for the purpose of detecting read errors (this may be by barcode).
- d. The vendor shall provide to the Attorney General written procedures for how the secrecy of votes will be ensured. The Attorney General shall be responsible for disseminating this information to the county boards of election and make this available to the public.
- e. The vendor shall provide to the Attorney General written procedures to identify and resolve any discrepancy between an electronic record and its corresponding paper record. The OAG shall be responsible for disseminating this information to the county boards of election.
- f. The vendor shall include written procedures for determining what constitutes clear evidence that a paper record is inaccurate, incomplete or unreadable. The OAG shall be responsible for disseminating this information to the county boards of election.